



**University of  
Zurich**<sup>UZH</sup>

**Zurich Open Repository and  
Archive**

University of Zurich  
University Library  
Strickhofstrasse 39  
CH-8057 Zurich  
[www.zora.uzh.ch](http://www.zora.uzh.ch)

---

Year: 2017

---

## **The importance of central-visual perception disorders for dyslexia and dyscalculia**

Kucian, Karin

**Abstract:** Visual perception disorders can lead to different learning disorders in children. These are often difficulties in reading and writing, as well as in calculation and number processing. Dyslexia, the specific reading and spelling disorder, is also associated with various deficits of visual perception which, for example, make it difficult to distinguish between individual letters or impair the text-dependent eye movements. From a neural point of view, the visual word form area (VWFA) in the fusiform gyrus, which is responsible for the visual processing of orthographic information must be highlighted, since the VWFA is often disturbed in dyslexics. Dyscalculia, the specific calculation disorder, is often associated with difficulties in visual-spatial processing. This is not surprising since our mental representation of numbers and magnitudes is spatially organized. This means we have a kind of mental number line on which we store numbers according to their magnitude. In the case of dyscalculia, the construction and the automated access to this mental number line are often disturbed. This mental number line is located in the intraparietal sulcus (IPS) of the brain, the region which shows increased abnormalities in dyscalculia, such as volume differences of gray matter, reduced activation or reduced connection to other cortical areas. Although central-visual perception disorders can clearly lead to learning disabilities of reading and writing, as well as calculation, dyslexia or dyscalculia is defined only when organic causes can be ruled out, which is why a differentiation between classical dyslexia or dyscalculia and problems in reading/writing and calculation due to visual deficits is necessary.

DOI: <https://doi.org/10.1055/s-0037-1602891>

Other titles: Die Bedeutung der ZVWS für die Dyslexie und Dyskalkulie

Posted at the Zurich Open Repository and Archive, University of Zurich

ZORA URL: <https://doi.org/10.5167/uzh-138256>

Conference or Workshop Item

Published Version

Originally published at:

Kucian, Karin (2017). The importance of central-visual perception disorders for dyslexia and dyscalculia. In: Neuropädiatrie 2017, Bad Nauheim, 27 April 2017 - 30 April 2017. Georg Thieme Verlag, S1-S45.

DOI: <https://doi.org/10.1055/s-0037-1602891>

- [EN](#)
- [DE](#)
- [Home](#)
- [Produkte](#)
  - [Zeitschriften](#)
  - [Bücher](#)
  - [Buchreihen](#)
- [Hilfe](#)
- [Kontakt](#)
- [Portal](#)

Neuropediatrics

Suche

Volltextsuche

- [Volltextsuche](#)
- [Autorensuche](#)
- [Titelsuche](#)
- [DOI-Suche](#)
- [Metadatensuche](#)

Daten absenden

- 
- 
- 
- 
- 
- [Zeitschrift](#)
  - [Aims and Scope](#)
  - [Herausgeber](#)
  - [Informationen zur DFG-Nationallizenz](#)
  - [Impressum](#)
- [Autoren](#)
  - [Autorenhinweise](#)
  - [Manuskript einreichen](#)
- [Abonnement](#)
  - [Ihr Abonnement: Kontakt & Information](#)
  - [Lizenzen: Kontaktpartner Institutionen](#)
- [Gesellschaft für Neuropädiatrie](#)
  - [Offizielles Organ der Gesellschaft für Neuropädiatrie](#)
- [Stellenmarkt](#)
  - [Aktuelle Stellenangebote](#)
- nicht eingeloggt [Login](#)
  - Benutzername:
  - Passwort:
  - 
  - [Passwort vergessen?](#) [Neu registrieren](#)
- [Warenkorb](#)

UZH Hauptbibliothek / Zentralbibliothek Zürich



Jahr  
2017

- [2018](#)
- [2017](#)
- [2016](#)
- [2015](#)
- [2014](#)
- [2013](#)
- [2012](#)
- [2011](#)
- [2010](#)
- [2009](#)
- [2008](#)
- [2007](#)
- [2006](#)
- [2005](#)
- [2004](#)
- [2003](#)
- [2002](#)
- [2001](#)
- [2000](#)
- [1999](#)
- [1998](#)
- [1997](#)
- [1996](#)
- [1995](#)
- [1994](#)
- [1993](#)
- [1992](#)
- [1991](#)
- [1990](#)
- [1989](#)
- [1988](#)
- [1987](#)
- [1986](#)
- [1985](#)
- [1984](#)
- [1983](#)
- [1982](#)
- [1981](#)
- [1980](#)
- [1979](#)
- [1978](#)
- [1977](#)
- [1976](#)
- [1975](#)
- [1974](#)
- [1973](#)
- [1972](#)
- [1971](#)
- [1970](#)
- [1969](#)

## Ausgabe

- [06: 403-486](#)
- [05: 323-402](#)
- [04: Neuromuscular Disorders in Children and Adolescents](#)
- [03: 133-208](#)
- [02: 61-132 | v](#)
- [01: 1-60](#)
- [S 01: e1 | Abstracts of the 43rd Annual Meeting of the Society ...](#)

- [Inhaltsverzeichnis](#)
- [aktuelle Ausgabe](#)
- [Probeausgabe \(01/2018\)](#)

## Anzeige



**Diese seltene angeborene  
Stoffwechselerkrankung  
wird oft jahrelang  
nicht diagnostiziert!**

Mehr erfahren 

## Ähnliche Zeitschriften

- [Journal of Neurological Surgery](#)
- [Indian Journal of Neurosurgery](#)
- [Indian Journal of Neurotrauma](#)
- [European Journal of Pediatric Surgery](#)
- [Current Research: Concussion](#)
- [Journal of Child Science](#)
- [International Journal of Epilepsy](#)

## Bücher zum Thema

- [Neurologie](#)

- [Pädiatrie](#)
- [Neurochirurgie](#)

Advertorial

**Thieme Medizinjobs Cross-Media-Pakete: Print, Online, Digital**

Vom Anästhesiologen über MTRAs bis hin zu Gesundheits- und Pflegekräften erreichen wir ärztliche und pflegerische Fachkräfte. Wir bieten Ihnen individuelle Cross-Media-Pakete für eine streuverlustfreie Kandidatenansprache von aktiv-suchenden und nicht-aktiv-suchenden-Bewerbern.

[Hier geht es zu unseren Mediadaten >>](#)

**Teilen / Bookmarken**

[Facebook](#) [Twitter](#) [Linkedin](#) [Google+](#) [Weibo](#) [CiteULike](#)

Neuropediatrics 2017; 48(S 01): S1-S45

DOI: 10.1055/s-0037-1602891

KSS – Key Subject Session

Georg Thieme Verlag KG Stuttgart · New York

## The Importance of Central-Visual Perception Disorders for Dyslexia and Dyscalculia

K. Kucian

Center for MR Research, University Children's Hospital Zurich, Zurich, Switzerland

[› Institutsangaben](#)

Weitere Informationen

**Publikationsverlauf**

Publikationsdatum:

26.April 2017 (online)

- [Kongressbeitrag](#)
- [Volltext](#)

Visual perception disorders can lead to different learning disorders in children. These are often difficulties in reading and writing, as well as in calculation and number processing.

Dyslexia, the specific reading and spelling disorder, is also associated with various deficits of visual perception which, for example, make it difficult to distinguish between individual letters or impair the text-dependent eye movements. From a neural point of view, the visual word form area (VWFA) in the fusiform gyrus, which is responsible for the visual processing of orthographic information must be highlighted, since the VWFA is often disturbed in dyslexics.

Dyscalculia, the specific calculation disorder, is often associated with difficulties in visual-spatial processing. This is not surprising since our mental representation of numbers and magnitudes is

spatially organized. This means we have a kind of mental number line on which we store numbers according to their magnitude. In the case of dyscalculia, the construction and the automated access to this mental number line are often disturbed. This mental number line is located in the intraparietal sulcus (IPS) of the brain, the region which shows increased abnormalities in dyscalculia, such as volume differences of gray matter, reduced activation or reduced connection to other cortical areas.

Although central-visual perception disorders can clearly lead to learning disabilities of reading and writing, as well as calculation, dyslexia or dyscalculia is defined only when organic causes can be ruled out, which is why a differentiation between classical dyslexia or dyscalculia and problems in reading/writing and calculation due to visual deficits is necessary.

<#>

Die Autoren geben an, dass kein Interessenkonflikt besteht.

[zum Seitenanfang](#)

© 2018 Georg Thieme Verlag KG | [Impressum](#) | [Datenschutz](#) | [Smartphone Version](#)

Ihre aktuelle IP-Adresse: 130.60.47.161

Anzeige



The advertisement features the logos of Thieme and enago at the top. Below them is a photograph of four people (three women and one man) looking at a laptop. The bottom of the ad is split into two colored sections: a dark blue section on the left and a red section on the right. The blue section contains the text 'Improve the quality of your manuscript before submission' and a yellow button that says 'Know More >>'. The red section contains a large yellow '20%' with 'OFF' in smaller text below it, and the text 'On Thieme Language Editing Services' at the bottom.

Anzeige

# Warten Sie nicht zu lange...

Nur bis 28.02. Fachzeitschriften  
im Angebot

**Jetzt bestellen!**

A large, white, 3D-rendered dinosaur skull is positioned in the foreground, facing left. It is set against a backdrop of a desert landscape with rolling sand dunes under a clear blue sky. The scene is illuminated by the warm, golden light of a setting or rising sun, creating a dramatic silhouette effect on the skull and the dunes. The overall composition is clean and professional, typical of a marketing advertisement.